Technical Bulletin
Forest Health Notes #73

Mississippi Southern Pine Beetle Predictions for 2014

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The Mississippi Forestry Commission participates annually in a south-wide southern pine beetle (*Dendroctonus frontalis*, Fig. 1) survey. The southern pine beetle (SPB) has the potential to destroy millions of acres of pine timber in any given year. The Texas Forest Service has developed a reliable system (Fig. 2) for predicting SPB infestation trends (increasing, static, and declining) and levels (low, moderate, high, and outbreak) that has been implemented across the South since 1986. This information provides forest managers with valuable insight for better anticipating SPB outbreaks and more lead-time for scheduling detection flights and preparing suppression programs.

Each spring, Lindgren funnel traps (Fig. 3) baited with the SPB attractant pheromones (frontalin) and volatile host compounds (alpha-pinene and beta-pinene) are set out in pine forests when dogwoods begin to bloom. Dogwood blooms are a good indicator for the primary dispersal season for the destructive SPB as well as their primary predators. This year, surveys were conducted by the Mississippi Forestry Commission (MFC) in the following counties: Amite, Chickasaw, Choctaw, Copiah, Forrest, Franklin, Itawamba, Leake, Lincoln, Marion, Montgomery, Panola, Rankin, Scott, Smith, Stone, Tishomingo, Wilkinson, and Winston (Fig. 4). One-four traps (depending on location and amount of susceptible host type in each county) were placed in each of the above counties, and the contents of each trap were collected weekly for four weeks.

The numbers of SPB and their primary predator, the checkered clerid beetle (*Thanasimus dubius*, Fig. 5), were identified in each sample. These data form the basis for a SPB risk rating system (Fig. 2) developed by the Texas Forest Service. The calculations take the checkered clerid beetles into account because they are so important in regulating SPB populations. The USDA Forest Service also conducts similar surveys on Federal Lands throughout the South. Their results for National Forests in Mississippi are included along with those collected by the MFC in Table 1.

In general, average trap catches that exceed 30 SPB/day, especially those in which SPB make up more than 35% of the total catch (of SPB and clerids), are indicative of increasing or continued high SPB infestation levels in the current year in southern states. Conversely, when catches of predators far outnumber those of SPB and fewer than 10 SPB adults are caught per day, infestation trends are likely to decline or remain at low levels.

Although SPB trap captures were relatively low throughout Mississippi this spring, more than 100 SPB infestations have been detected in and around the Trace Unit of Tombigbee National Forest (Between Huston and Tupelo, MS) since Fall 2013. As a result, **landowners near the Trace Unit of the Tombigbee National Forest, especially those in Chickasaw and Pontotoc counties, are urged to pay particular attention to signs or symptoms of SPB attack.**

The SPB outbreak in Homochitto National Forest (HNF) appears to have collapsed last year, based both on only a few new infestations during 2013 and low trap captures on HNF during spring 2014 survey. Nevertheless, landowners in counties surrounding HNF (**Amite, Copiah, Franklin, Lincoln,**

and Wilkinson counties), as well as landowners near **Bienville and Tombigbee National Forest**, especially those in **Scott** and **Smith** counties, should keep a close eye out for SPB infestations this year, because populations appear to be on the rise statewide (based on number of infestations rather than trap captures). Additionally, an ongoing outbreak of sawfly larvae in Itawamba county warrants increased vigilance for subsequent bark beetle activity on trees stressed by defoliation.

Although no state or private lands surveyed by the MFC during 2014 had trap catches that exceeded 30 SPB/day on average, the numbers of infestations on and adjacent to Federal Lands in the above mentioned counties indicate building populations of SPB (Table 1). SPB were intercepted in 14 counties this year, as compared to 10 in 2013, 7 in 2012, and 5 counties during 2011. 578 SPB were intercepted in traps during the 2014 spring trapping season. In 2013, 5,325 SPB were captured during MFC's survey, which was a dramatic increase over 149 total SPB captures in 2012 and 579 in 2011. However, the general increase in SPB interceptions over the last few years coupled with increased number of infestations at various locations around the state (especially areas around HNF, Trace unit of TNF, and Scott and Smith counties near Bienville National Forest warrant some concern. All other counties surveyed by MFC are predicted to have static or declining SPB population growth and none or very few infestations.

Annual predictions of infestation trends have historically proven to be 75-85% accurate. Collectively, trend predictions from numerous specific locations provide insight into SPB population shifts within a given state as well as across the South. Also, comparison of trapping results for the current year with those from the previous year for the same localities provides additional insight into SPB population changes.

If populations of SPB continue to rise in Mississippi, it will become critical for private landowners to walk over your property or have it surveyed to detect any signs of early buildup of damaging agents. SPB can be very destructive and can cause significant financial loss in a short period of time.

We appreciate Dr. Ronald Billings of the Texas Forest Service (979-458-6650 or rbillings@tfs.tamu.edu) for developing the SPB risk rating system and for providing south-wide summaries and predictions of which portions have been included here. The results for the entire south-wide survey are posted on the Texas Forest Service Website. Additional thanks to the MFC foresters who placed and checked the traps throughout Mississippi.

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Figure 1: The southern pine beetle (Dendroctonus frontalis) is historically the most destructive forest insect pest of Southern forests.

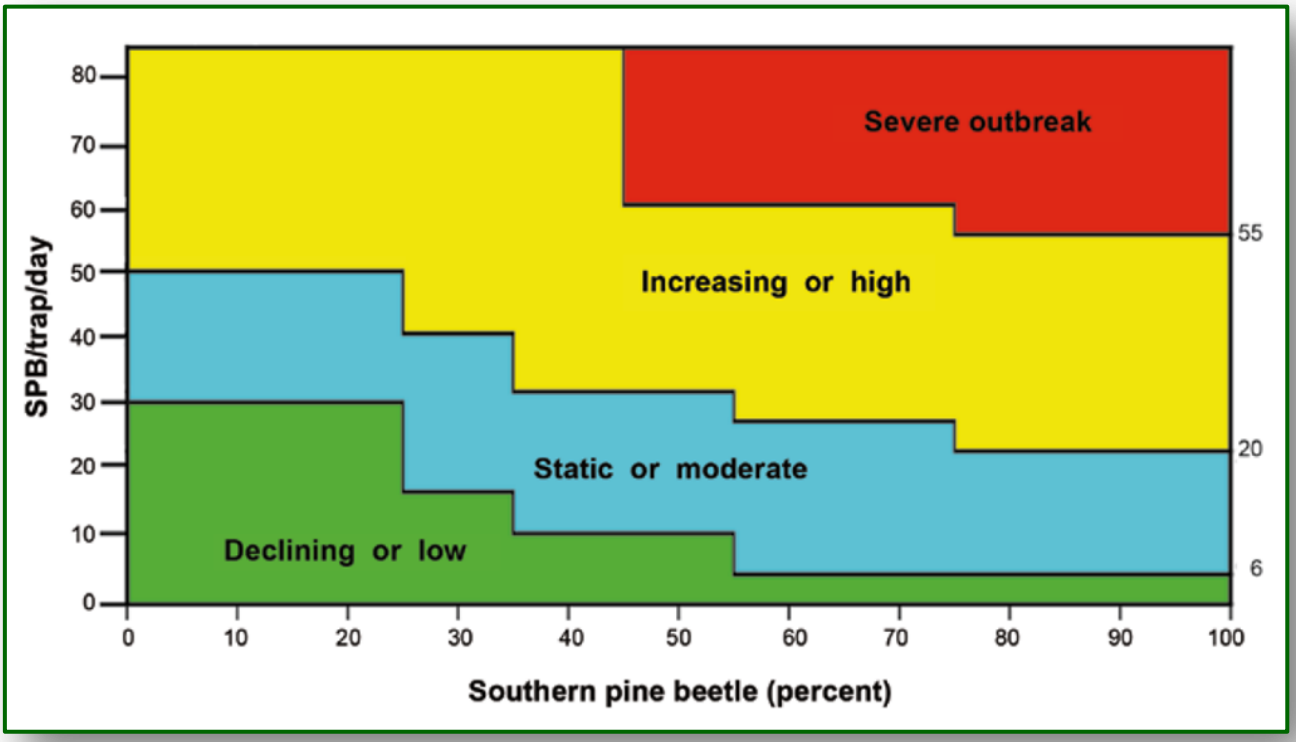

***Figure 2:** The annual regional SPB prediction relies on the system to predict SPB severity during the survey year, and is based on the number of SPB captured per trap per day, and the percent SPB (vs. their major predator, the checkered clerid beetle) per trap per day. From:* **Billings, Ronald F; Upton, William W. 2010. A methodology for assessing annual risk of southern pine beetle outbreaks across the southern region using pheromone traps. Pp. 73-85. In: Pye, John M.; Rauscher, H. Michael; Sands, Yasmeen; Lee, Danny C.; Beatty, Jerome S., tech. eds. 2010. Advances in threat assessment and their application to forest and rangeland management. Gen. Tech. Rep. PNW-GTR-802. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest and Southern Research Stations. 246p.**

Figure 3: A Lindgren funnel trap, used throughout Mississippi, each spring to monitor southern pine beetle populations.

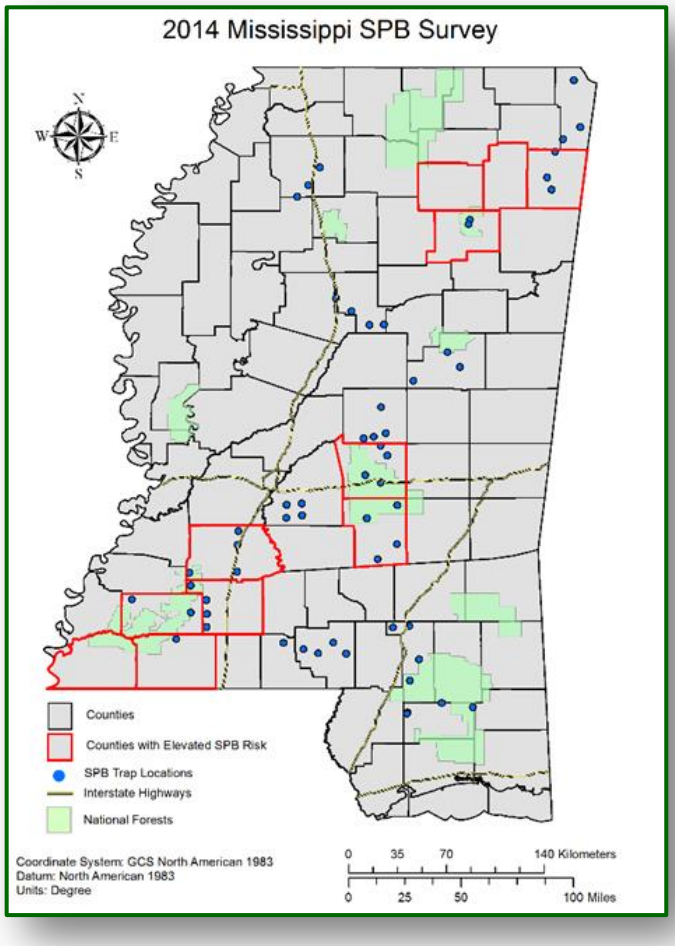

Figure 4: Mississippi spring 2014 southern pine beetle trapping survey locations.

Figure 5: The checkered clerid beetle, Thanasimus dubius, the most important predator of the southern pine beetle.

	County	# of Traps	Number SPB	Number Clerids	Percent SPB	SPB/trap/day	Clerids/trap/day	[2]Prediction
USDA Forest Service Trapping	Bienville N.F.	3	143	461	24%	1.7	5.5	S/M
	Chickasawhay R.D.	3	0	1,119	0%	0.0	11.9	D/L
	Desoto N. F.	3	0	1,680	0%	0.0	19.3	D/L
	[1]Homochitto N.F.	6	10,512	3,296	76%	62.6	19.6	S/M
	Tombigbee R. D.	3	1,120	4,465	20%	13.3	53.2	S/O
Mississippi Forestry Commission Trapping	Amite*	1	4	33	11%	0.1	1.2	D/L
	Chicasaw*	2	87	1,159	7%	0.1	1.2	D/L
	Copiah*	4	3	601	1%	0.1	5.4	D/L
	Forrest	4	1	152	1%	0.0	1.4	D/L
	Franklin*	2	16	293	5%	0.3	5.2	D/L
	Itawamba	3	5	404	1%	0.0	3.8	D/L
	Leake	4	4	557	1%	0.0	4.6	D/L
	Lincoln*	4	328	976	25%	2.9	8.7	D/L
	Marion	4	1	86	1%	0.0	0.7	D/L
	Montgomery	4	0	583	0%	0.0	5.4	D/L
	Panola	3	0	110	0%	0.0	1.3	D/L
	Rankin	4	1	289	1%	0.0	2.6	D/L
	Scott*	4	3	142	2%	0.0	1.4	D/L
	Smith*	4	75	771	9%	0.7	6.9	D/L
	Stone	4	0	182	0%	0.0	1.6	D/L
	Tishomingo	3	44	558	7%	0.5	6.3	D/L
	Wilkinson*	1	3	75	4%	0.1	2.7	D/L
	Winston	4	3	329	1%	0.0	2.8	D/L
	Average	**-**	**537.1**	**796.6**	**9%**	**3.6**	**7.5**	D/L

2014 Lures = Sirex lure (70% α-pinene, 30% β-pinene) and 2 frontalin capsules used on all traps

[1]USDA Forest Service Traps on Homochitto National Forest were sampled for 8 weeks (instead of 4) and had standard lures as well as endo-brevicomin lures. Both factors inflate trap captures.

[2]D=Declining, S=Static, I=Increasing, L=Low, M=Moderate, H=High, O=Outbreak

*Counties where special attention is needed, despite low trap captures.

Table 1: Mississippi Southern Pine Beetle Spring Survey Summary Results for 2014. SPB populations and infestations in eight counties in the vicinity of Bienville and Homochitto National Forests and the Trace Unit of the Tombigbee Ranger District continue to have mostly low rates of southern pine beetles capture, but current or recent infestations in these areas warrant extra vigilance.